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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,992	09/15/2003	F. Conrad Greer	50715/P004US/10311738	2249
29053	7590	07/13/2007		
FULBRIGHT & JAWORSKI L.L.P. 2200 ROSS AVENUE SUITE 2800 DALLAS, TX 75201-2784			EXAMINER NGUYEN, NGOC YEN M	
			ART UNIT 1754	PAPER NUMBER
			MAIL DATE 07/13/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/662,992	Applicant(s) GREER ET AL.	
	Examiner Ngoc-Yen M. Nguyen	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2007.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                           | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### DETAILED ACTION

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-24, 26, 28-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "metal" in claim 1 is used by the claim to mean "metal compound" (note claim 3), while the accepted meaning is *pure* "metal" or possibly a metal alloy. The term is indefinite because the specification does not clearly redefine the term.

In claims 28-30, it is unclear what is required by "a predetermined reaction temperature". Does the "reaction temperature" refer to the temperature in the "introducing" step, "agitating" step, "venting" step or "maintaining" step?

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojtowicz et al (4,034,070) in view of Mahmood et al (4,938,945), optionally in view of Zuzich et al (5,286,882).

Wojtowicz '070 discloses a process for preparing anhydrous metal which comprises reacting, in the presence of a nitrile having 2-4 carbon atoms, a metal with HF and halogen, both in substantially anhydrous form, said halogen being selected from the group consisting of chlorine, bromine, iodide and a mixture thereof, the reaction being carried out using, per every gram-equivalent of metal, about 0.1-50 gram-moles (i.e. moles) of HF and about 0.025-25 gram-moles of halogen (note claim 1). Thus, for every gram of metal,  $(0.1-50) * (\text{MW of HF} = 20)$  or 2-1000 g of HF are used. This range overlaps the claimed range. With respect to the encompassing and overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference

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because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ 549.

The metal reactant can be any one which will react with HF and halogen to form metal fluoride, for example iron among others (note column 1, lines 32-41).

Any convenient order of mixing the reactants and the nitrile may be employed. The HF and the nitrile may initially be mixed together, then the metal may be added followed by the bubbling in the halogen, or the halogen may be added to the HF-nitrile mixture followed by the final addition of the metal (note column 2, lines 25-32).

Wojtowicz '070 further discloses that the reaction can be effected at any suitable temperature, so that there is no criticality with respect to the temperature necessary to bring out reaction (note column 2, lines 32-46). Neither is there any criticality in the pressure used to effect the reaction. When elevated pressure is employed, means should be provided to vent off by-product HCl (note column 2, lines 47-54).

After the reactants and the nitrile are mixed together, the reaction usually proceeds spontaneously and quite rapidly. The resulting product mixture, containing the metal fluoride, is usually a stable mixture. It therefore can be stored as such, if desired, until such time as the recovery or separation of the metal fluoride is desired (note column 2, lines 60-66). Separation and recovery of the metal fluoride from the reaction product mixture can be achieved using any satisfactory, conventional technique. The ultimate product purity to be attained is usually a matter of choice depending on the intended field of utility (note paragraph bridging columns 2-3).

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For the apparatus limitations in the dependent claims, it is well settled that patentability of method claims cannot be predicated on apparatus limitations, In re Tarczy-Hornoch, 158 USPQ 141, 150 (CCPA 1968).

The differences are Wojtowicz '070 does not specifically disclose the step of preheating the anhydrous metal or the step of adding the anhydrous metal in steps.

Mahmood '945 discloses a process for producing anhydrous ferric fluoride according the endothermic reaction between ferric chloride and HF (note claim 1). Since the process is endothermic, the reaction temperature may be subjected to cooling below critical, which results in slow-down or even cessation of the reaction (note column 4, lines 20-26). Mahmood '945 also teaches that heat can be supplied to the reaction (note column 3, lines 23-26). It is also known in the art that the higher the temperature, the faster the reaction rate.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to supply heat to the reaction of Wojtowicz '070, as suggested by Mahmood '945 in order to accelerate the reaction rate and to prevent slow-down of the reaction due to the endothermic reaction between the iron and the HF acid. Without a showing of criticality or unexpected results, it is well within the skill of the artisan to supply the heat to either preheat either of the reactants or both or heat the combined reactants, as long as the optimum reaction temperature can be attained.

Mahmood '945 also teaches that means for agitating the reaction mass may be provided to ensure physical contact between the reactants (note column 3, lines 29-34

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and column 4, lines 65-68). Mahmood '945 can be applied to teach that ferric chloride can be used instead of the iron and chlorine.

For the rate of adding the metal to the HF acid, because the reaction between metal and the HF acid can be endothermic or exothermic, it would have been obvious to control the amount of the metal being added to HF acid in order to control the reaction temperature. As disclosed in Mahmood '945, HF acid is added to the metal compound and the amount of HF acid being added is controlled in order to maintain the desired reaction temperature.

Optionally, Zuzich '882 can be applied to teach that the reaction temperature in an exothermic reaction can be controlled by slowly adding the reactant (note column 13, lines 1-5). Such teaching would be equally applied for an endothermic reaction because by slowly adding the reactant, the drop in the temperature due to the endothermic reaction would be more gradual and it would be easier to compensate to the temperature loss.

Applicant's arguments filed May 4, 2007 have been fully considered but they are not persuasive.

Applicants argue that the written description requirement with regard to claims 1-30 has been satisfied.

It is noted that both the prior art mentioned in the instant specification and the description of the claimed invention recognize that metal and metal compounds are distinct in the process of making metal fluoride (note paragraphs [0004] and [0005] that

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separately recite "metal" and "nonfluorinated metal compound"; note also paragraphs [0026], [0029] that recite "metal and/or nonfluorinated metal compounds"). This clearly indicates that metal and metal compounds are different. The term "metal" would not encompass "metal compound" as now contemplated in the instant claims.

Applicants argue that Mahmood teaches heating the reaction vessel but does not teach or suggest the preheating of anhydrous metal.

Mahmood fairly teaches that the reaction temperature for forming iron fluoride needs to be maintained because the reaction is endothermic and if the reaction temperature is subject to cooling below critical which results in slow-down or even cessation of the reaction (note Mahmood '945, column 4, lines 20-26). Mahmood also teaches that a "heated vessel" may be utilized (note column 3, lines 23-25). The disclosure of "heated vessel" fairly teaches that extra energy is being introduced in order to maintain the reaction temperature. Even though Mahmood does not specifically disclose that the reactants are preheated, however, it would have been obvious to one skilled in the art to supply the extra energy to the reactants or to the reaction vessel as long as the extra energy can be used to maintain the reaction temperature.

Applicants argue that claim 1 requires introducing aliquots of the anhydrous metal into the anhydrous hydrofluoric acid in the reaction vessel at intervals.

Zuzich can be applied to teach that the rate of addition of reactants should be regulated to control the reaction temperature.

Applicants argue that Mahmood adds hydrofluoric acid to the metal compound.



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For the order of adding ingredients, See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.).

Applicants argue that Zuzich only teaches an exothermic reaction and the Examiner then makes a conclusion that the same teaching applies to an endothermic reaction, which is unsupported in the applied art.

Granted that the reaction in Zuzich is an exothermic reaction, however, in both exothermic reaction and endothermic reaction, there is a temperature change due to either reaction and there is a desire to control the reaction temperature. As taught in Zuzich, to control the reaction temperature, the rate of adding the reactants needs to be control, i.e. the slower the rate of adding the reactants, the smaller the change in the reaction temperature, in Zuzich case, the slower the increase in the reaction temperature. It would have been obvious to one skilled in the art to expect the same result when the teaching of Zuzich is applied for an endothermic reaction, i.e. the slower the rate of adding the reactants, the slower the decrease in the reaction temperature.

The rejection of claims 2-24, 26, 30, 32-34 is maintained for the same reasons as stated above.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on a Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Ngoc-Yen M. Nguyen  
Primary Examiner  
Art Unit 1754

nmn  
July 9, 2007